

For Many, Utah's Dead Sea Is Truly a Great Salt Lake

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says Ty Harrison, an associate professor of botany at Westminster College. "They're the end product of 15,000 years of rapid evolution."

Ella Sorensen, a birder from West Valley City, adds this about the lake she loves: "There are waves. There is foam. There is a cacophony of all the different sounds. You hear avocets weep and calls from the terns. The yellow-headed blackbirds sound like a strangled cat. You've got the quacks of ducks. Then, the sky broadens out and you get a feeling of space. People who call it a disgrace and say it stinks haven't really been there."

University of Utah geologist Frank DeCourten knelt down in an old river bed just off the Pony Express trail and sifted 22,000-year-old Lake Bonneville ooze in his hands. Poking through the dirt in Juab County, he found tiny shells.

"These," he proclaims, "are the remains of creatures which lived in this mud 20,000 years ago." Geologists like Mr. DeCourten have discovered a world in Lake Bonneville's sediment almost unimaginable to modern-day residents.

"The strangest animals are those found in the gravels and shorelines of Lake Bonneville," says Mr. DeCourten. "You find exotic Ice Age creatures like mastodons, saber-tooth tigers, giant ground sloths, musk oxen, native North American horses now extinct and camels. They were here just 20,000 years ago."

Evidence of Lake Bonneville can now be seen by looking closely at the benches of Great Basin valleys. When the huge freshwater lake formed 70,000 years ago, it covered parts of Utah, Idaho and Nevada.

Then, about 14,500 years ago, a natural dam in Cache Valley collapsed. That caused 35 million cubic feet of water per second to be released from Lake Bonneville into Idaho's Snake River Valley. During a four- to six-week period, the amount of water pouring into the world's seas nearly doubled.



Great Salt Lake's rise in mid-'80s made an island resort of Saltair.

"That," says Mr. DeCourten, "is one of my favorite catatylisms."

It also marked the beginning of the end of Lake Bonneville. As the weather warmed and the Ice Age ended, Lake Bonneville slowly shrank. The Great Salt Lake is its legacy. "And it is not a static puddle of saline water," the geologist adds, "but a dynamic water that has expanded and contracted."

Ask Hal Charles of West Valley City about the lake's dynamics. On a Sunday evening in mid-June last year, Mr. Charles and his family were enjoying a leisurely sail between Antelope and Stansbury islands when a "Tooele twister" turned the quiet lake into a life-threatening monster.

A strong gust of wind, or microburst, slapped one side of the boat, and before Mr. Charles and his son could react, they were hit with another blast from the other direction.

"We tipped from one side to the other in just about two seconds," Mr. Charles recalls. "It was unbelievable."

The 21-foot boat was on its side, taking in water. Only the mast, touching bottom on the shallow lake, prevented the craft from tipping over completely. Mr. Charles,

his wife and son held onto the side of the boat and watched the awesome storm work its way across the lake.

"It scooped up water, just like a tornado," Mr. Charles recalls. "It looked like the water was dancing."

Says William Alder, a meteorologist with the National Weather Service: "Microbursts and erratic winds anywhere from 40 to 60 miles per hour, enough to cause 4- and 5-foot waves, can come up suddenly."

The lake also can be blamed for fog in surrounding valleys. And the so-called "lake effect" — which occurs when cold air rolls across the lake, vacuums up moisture and dumps it on the Wasatch Front — accounts for much of the area's snowfall. "There are a lot of things the lake has up her sleeve which makes forecasting the lake effect kind of spooky," Mr. Alder adds.

Those who walk along a Great Salt Lake dike — at any of the eight wildlife refuges — touch history.

The nation's first man-made public marsh, the Public Shooting Grounds, opened in 1923 on the north side of the lake. The Bear

River Migratory Bird Refuge became the flagship of the federal system in 1928 when 65,000 acres were acquired by Congress. The Civilian Conservation Corps developed Locomotive Springs in 1931, Farmington Bay in 1935 and Ogden Bay in 1937.

These man-made impoundments created lush marshes. But are they natural?

Peter Behrens, the vice chairman of the Great Salt Lake Minerals Company for the past 25 years, wonders.

"When a dike is built to create a bird refuge, people consider it a good dike because it helps Mother Nature," the civil engineer says. "When we build a dike to extract minerals, that's considered a bad dike. We're told we're interfering with nature."

Mr. Behrens' mining company — one of six on the lake — produces salt, potash and magnesium by pumping water from the Great Salt Lake into 100 evaporation ponds covering 36,000 acres. As the water evaporates, huge front loaders are used to remove minerals from the miniature lakes. In 1990, mining companies harvested almost 1.6 million tons, and the value of the minerals was more than \$150 million.

During the 1890s, there was a different kind of mining going on: Pioneers in need of fertilizer scooped up bird guano on Gunnison Island. This barren patch of land — a scant 164 acres — grows and shrinks with the rise and decline of the Great Salt Lake. It also remains a nesting ground for some 19,000 California gulls and 18,000 pelicans, which trek to the lake from the Gulf of Mexico and the Gulf of California.

Though the island is closed to the public during the nesting period, Division of Wildlife Resources' biologist Don Paul once paid a spring visit to conduct biological work.

"It's like watching one of the most spectacular bird-nesting scenes you've ever seen in any nature movie," Mr. Paul says. "You get a selfish feeling out there. It's like walking on hallowed ground or finding a lost treasure in a pirate's cave. It's a spiritual feeling."

In 1895 a poet named Alfred Lambourne was likely trying to raise his spirits by growing grapes on the island for wine. But the Mormon Church, no doubt suspicious about what the settler planned to do with the grapes, sent him back to the mainland.

Great Salt Lake's most colorful and dynamic period began in 1870, a year after the transcontinental railroad was completed. Resorts featuring bathing beaches, boat docks, dance halls and hotels popped up along the shores, offering Utahns unique swimming and entertainment opportunities into the 1950s.

John W. Young — Brigham's third son — opened the first resort in 1870. But when the lake started to recede more than 20 years later, he moved it to what is now known as Lagoon.

The old Saltair resort, constructed in 1893 by the Salt Lake and Los Angeles Railroad Company at a cost of more than \$350,000, was once the jewel of the lake. During the Roaring '20s, Inter-mountain residents rode trains to this combination dance hall-amusement park, where they were unloaded onto a 4,000-foot pier. The Moorish-looking pavilion burned to the ground in 1925 but was rebuilt on the same spot. Retreating waters left it high and dry in the 1930s. After being closed more than a decade, the building burned in 1970, probably the victim of an arsonist.

Wally Wright developed a new Saltair south of the original in the spring of 1983. A year later, the fickle lake struck again. This time, flood waters destroyed the interior of the building months after it opened.

Mr. Wright says his two sons were preparing a freshwater pond for tourists when a large wave from the lake swamped it. "My sons had to run for their lives," Mr. Wright recalls. "At that point, I knew we would be shut down."

Pushed by record rain and snow, the Great Salt Lake wiped out the Antelope Island causeway in 1983. The lake rose to a record level of 4,211.85 feet on June 3, 1986, and again on March 30, 1987. (The record low of 4,191 feet was set in 1963.)

In an attempt to control flooding in suburban areas, engineers breached the Southern Pacific Causeway. The 300-foot-wide breach may have eliminated the color difference and salinity level of the two parts of the lake, but it didn't drop the south-side level enough. Gov. Norm Bangerter worried that the rising waters would wipe out freeways. The Salt Lake City International Airport

GREAT SALT LAKE Timeline

Source: Carol Withrow, Audubon Society

70,000 Years Ago — Lake Bonneville, a freshwater lake, comes into existence.

14,500 Years Ago — A natural sediment dam in Cache Valley collapses, allowing 35 million cubic feet of Lake Bonneville water per second to release into the Snake River and eventually into the Pacific Ocean. The amount of water pouring into the world's seas doubles. The flow accounts for one half of the world's river discharge at the time. This is the beginning of the end for Lake Bonneville.

12,000 Years Ago — The first humans arrive in the area.

10,000 Years Ago — Lake Bonneville becomes a shrinking, saline lake.

9,000 Years Ago — Lake Bonneville reaches roughly the level of present Great Salt Lake, the name used to reference it for times after this.

1,000 A.D. — People of a Pueblo culture move in from the south.

1400 — Shoshoni from the southwestern Great Basin move in and replace the existing inhabitants.

1776 — Spanish priests, Dominguez and Escalante, enter Utah Valley from Spanish Fork Canyon. Ute Indians tell them of the great lake 50 miles north with waters "harmful or extremely salty." Friars leave without seeing the lake, but take the first report of its existence to the outside world.

1805 — Lewis and Clark write that unnamed Spanish traders are active in the valley.

1824 — Fur trapper Jim Bridger encounters the Great Salt Lake, but believes it to be the Pacific Ocean.

1826 — Fur trappers circle lake in skin boats and discover that it is not the ocean and has no outlet.

1835 — First crude map of the Great Salt Lake made by trapper, explorer and Army Capt. B. L. E. de Bonneville, who gets as close as Bear Lake but never actually sees the Great Salt Lake.

1841 — Nancy Kelsey becomes the first immigrant woman to see the Great Salt Lake. This 19-year-old passes along the north shore while immigrating with her husband and baby from Missouri to California.

1843 — Capt. John C. Fremont makes the first scientific exploration of the lake, formally names it and maps most of the islands.

1846 — The ill-fated Donner-Reed party starts west across the Great Salt Lake desert. Only 47 of the 87-member party reach California.

1850 — The LDS Church reserves Antelope and Stansbury islands for grazing.

1869 — The lake is first used for commercial navigation to help build the U.S. railroad system. The first steamboat, the Kate Conner, is launched on the lake.

1869 — The Golden Spike is driven at Promontory, near the north shore of the lake, uniting the Central Pacific and Union Pacific railways.

1870 — John W. Young (Brigham's third son) opens the Lake Side resort near Farmington. This first of many resorts is moved in 1894 due to the receding lake and becomes present-day Lagoon.

1873 — The first dikes are built for making evaporation ponds to reclaim lake minerals.

1877 — The Salt Lake Yacht Club begins first active operation.

1893 — Saltair is built west of existing Salt Lake International Airport. The resort features bathing facilities and a huge dance floor mounted on springs. A train transports visitors from Salt Lake City to Saltair where they are unloaded onto a 4,000-foot pier.

1896 — Utah secures statehood.

1903 — Southern Pacific Railroad uses 28,000 wooden pilings to construct the Lucin Cutoff across the middle of the lake.

1925 — Saltair burns to the pilings; rebuilt on the same spot.

1928 — Congress establishes the Bear River Migratory Bird Refuge.

1937 — Orson Spencer sets a record for swimming from Antelope Island to Black Rock in three hours, 40 minutes and 52 seconds.

1959 — Southern Pacific Railroad replaces wooden trestle causeway with a rock-filled causeway, dividing the lake into a saltier northern arm and a less-salty southern arm. The construction, jointly financed with the federal government, uses 50 million cubic yards of rock.

1963 — Record low lake level of 4,191.35 feet.

1969 — The state opens Great Salt Lake State Park on the north end of Antelope Island.

1970 — Saltair burns again. It is not rebuilt at original site.

1971 — The U.S. Supreme Court rules that the lake bed — then underwater — is the property of the state, opening the way to commercial exploitation.

1982 — With increasing precipitation in mountains, the lake begins to rise.

1984 — New Saltair development, which opened five months earlier south of original site, begins to shut down due to rising lake waters.

1984 — A 300-foot opening is blasted in the Southern Pacific causeway at the request of the state. The breach helps to solve flooding problems on south end. It also eliminates some color differences between the two arms and slowly starts to reduce differences in salinity levels.

1986 — In a four-year period, the lake rises 12 feet and its volume doubles. The shoreline is extended up to 12 miles covering an additional 600,000 acres.

1987 — The west desert pumping program begins, with the purpose of controlling the lake level.

1992 — Antelope Island is scheduled to reopen in the fall.

Mark Knudsen / The Salt Lake Tribune

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also was threatened.

The governor and Legislature elected to spend \$60 million to construct gigantic pumps on the west side of the lake. When activated in April 1987, a drought year, the pumps helped reduce the lake level almost 6 feet. The pumps, shut down in June 1989, now sit idle.

Mr. Wright, meanwhile, patiently waits for the lake's inevitable decline. He uses a bulldozer to remove mud and rock, and dreams of the day when the building will open again. Nearby, vendors now sell trinkets out of old train cars and a faded white trailer.

Sir Malcolm Campbell of Great Britain first brought the Bonneville Salt Flats notoriety in 1935 when he raced across the crusty salt at 301.13 mph for a new world land-speed record.

Californian Craig Breedlove, driving in "The Spirit of America," gained international fame in the 1960s when he became the first to break the 400-, 500- and 600-mph barriers. Gary Gabelich utilized a rocket-powered wheeled vehicle on Oct. 23, 1970, to become the fastest man on the salt. He traveled 622.407 mph on that record attempt.

The salt flats, once flooded by ancient Lake Bonneville, are the remains of a much larger Great Salt Lake. After thousands of years of drying, the flats are ideal for the land-speed attempts.

The race cars create a colorful

contrast on the sea of white crust. But the show doesn't end there. Camping on the flats during a meteor shower is like spending a night on an alien planet. As stars shoot across the clear sky, the lifeless, flat terrain takes on an eerie glow. Even on a moonless night, the mountains loom like strange pieces of abstract art.

This picture may not hold forever, though. Some drivers, environmentalists and geologists worry that the flats may someday disappear. Highway development and mining operations have caused the thickness of the salt to be reduced about 1 percent a year for the past 28 years.

This big briny lake, scorned and misunderstood, surprises even those who often ply its waters.

Mitch Larsson, who has managed Antelope Island for the past 14 years, recalls one memorable night when he answered a rescue call for a stranded boater.

"There was a full moon," Mr. Larsson recalls. "The water was like glass. You could see all the lights of the city. I've seen it when it's nice. I've seen it when it's hard. But there's always something different. I've spent 14 years out here and I've not even seen or learned about half of what's there."

Adds author Terry Tempest Williams: "It's a place where nothing is as it appears. It is a landscape of the imagination where anything is possible."